

Electronic gadgets use and sleep quality among medical students during COVID-19 Lockdown

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Abstract

BACKGROUND: The Nepal Government imposed two national-level lockdowns to curtail the spread of coronavirus. Schools, colleges, and universities were briefly shut leading students to stay indoors. Change in daily routine, online education and plenty of free time has ultimately led to an increase in use of electronic gadgets like smartphones, laptops, etc. There have not been enough studies to evaluate the usage pattern of electronic gadgets and sleep quality among undergraduate medical students of Nepal before and during the COVID-19 lockdown. Our study aims to evaluate the usage pattern of electronic gadgets and sleep quality among undergraduate medical students before and during the COVID-19 lockdown in Nepal.

METHODOLOGY: This cross-sectional study was conducted among 208 undergraduate medical students of Lumbini Medical College, Tansen, Palpa. Participants were requested to fill up an online questionnaire circulated via Viber and Facebook messenger. Gadget usage pattern and sleep quality before and during COVID-19 lockdown were evaluated using Smartphone addiction score-short version (SAS-SV) and Pittsburgh Sleep Quality Index (PSQI) respectively.

RESULTS: Of 208 responses which met the inclusion criteria, smartphone addiction was seen 94 (46.30%) respondents with higher number of male addicts (27.59%). Mean time spent in electronic gadgets raised significantly during lockdown compared to pre-COVID phase. 99 (48.77%) respondents had impaired sleep according to PSQI global sleep score. Significant relation was present between most of the components of PSQI with addicts and non-addicts.

CONCLUSION: This study is merely a partial snapshot of the present scenario and provides preliminary understanding on smartphone use pattern and sleep quality among medical students from Nepal. It is critical to decrease total screen time and promote sleep quality for the betterment of physical and mental health of the future health care professionals.

1. Introduction

The world is currently facing coronavirus disease 2019 (COVID-19) pandemic caused by a novel coronavirus called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) which was first unveiled in Wuhan, China in December 2019. This virus has spread to more than 200 countries infecting 238,447,702 people and claiming 4,864,876 lives worldwide, as of 10th October 2021.[1] Nepal joined the pandemic by registering its first case of COVID-19 on 23rd July 2020.[2] To curtail the transmission of the virus and protect its people, the Nepal government enforced two national-level lockdowns first on March 24, 2020, and second on April 29, 2021, with the closure of borders, restricting domestic as well as abroad travels and limiting other non-critical services like movie halls, shopping malls, stadiums and so forth [3, 4] These prohibitions were extended several times and have affected all the segments of society by creating social, economic, and educational havoc. Schools, colleges, and universities were temporarily closed, forcing the students to stay indoors at home. Medical schools were no exception, and medical

students were sent home as well. With very little to do at home and electronic gadgets like smartphones, laptops, tablets, etc being easily available, students found a way to spend their time by indulging themselves in electronic gadgets and the Internet.

In today's global scenario, smartphones have become an indispensable part of our life and it plays an important role in our everyday activities.[5] Apart from conventional communication purposes, smartphones can be used for playing games, browsing the internet and social media like Facebook, Instagram, Viber, etc., and watching movies and series.

Sleep is critical for good health. According to CDC, a normal adolescent requires around 8.5-10 hours per day. Various studies have shown that increased use of electronic gadgets especially smartphones is associated with disturbances in sleep, daytime dysfunction, depression, anxiety, and poor academic performances.[6, 7] Disturbances in sleep because of prolonged use of electronic gadgets especially smartphones can be attributed to interference in sleep through heightened psychological and physiological arousal by the theme of the material, excessive bright light exposure that delays circadian rhythm, exposure to electromagnetic radiations, and physical discomfort like muscle pain and headache after excessive gadgets use. [8] Both quality and quantity of sleep are important but, unfortunately, excessive screen time is associated with shorter sleep duration and poor sleep quality. [9] Thus, it is fundamental to screen for smartphone addiction and sleep disturbances for early identification and timely management of this unconventional disorder.

This present study aims to evaluate total screen time of electronic gadgets before and during the lockdown, smartphone addiction using Smartphone addiction scale-short version (SAS-SV), sleep quality during lockdown using Pittsburgh sleep quality index (PSQI), and to find any relation between electronic gadgets use and quality of sleep among undergraduate medical students of Nepal during COVID-19 lockdown.

2. Methods

After the approval was obtained from Institutional Review Committee (IRC) of Lumbini Medical College and Teaching Hospital (LMCTH), Nepal, a cross-sectional study was conducted during August 2021 and September 2021 of COVID-19 lockdown among the medical students of the same institution. Medical students of batch first, second, third and fourth year studying in LMCTH constituted the study population.

A structured questionnaire comprising socio-demographic profiles of students and validated scales was used for data collection. The questionnaire was typed in Google Form and the link to the questionnaire was circulated to all the medical students of Lumbini Medical College through Viber and Facebook messenger. To ensure privacy, participant's name, email, and other identity-revealing questions were not included in the questionnaire. Settings were adjusted such that no participants could fill-up the form twice. On clicking the link, the participants were directed to a page where the details and the objective of the study was explained. If the participants consented to participate then, they would access the next

page to fill up the questionnaire. If the participant did not consent, then it would submit the form. The questionnaire comprised of three parts

2.1 Characteristics of the respondents which included general information questions and sociodemographic variables like age, gender, electronic gadgets owned, what they use gadgets for, total time spent on gadgets per day before and after lockdown, bedtime, wake time, etc to assess electronic gadgets use and sleep quality before and after lockdown.

2.2 Smartphone Addiction Scale-Short Version (SAS-SV)- This is a 10 questions self-administered scale used for screening smartphone addiction. The questions were answered by study subjects and scored on a six-point Likert scale with a maximum and minimum score of 60 and 10 respectively. According to SAS-SV, the cut-off value is 31 for males and 33 for girls. Higher value reflects smartphone addiction. [10]

2.3 Pittsburgh Sleep Quality Index (PSQI) - It is a self-administered scale comprising 19 questions. PQSI measures sleep quality through 7 different components viz. component 1 (C1)- subjective sleep quality, component 2 (C2)- sleep quality, component 3 (C3)- sleep duration, component 4 (C4)- habitual sleep efficiency, component 5 (C5)- sleep disturbances, component 6 (C6) - use of sleep medication, component 7 (C7)- daytime dysfunction. The global PQSI score is calculated by adding all these components. It has a minimum score of zero and a maximum score of 21. A cut-off value of 5 indicates impaired sleep. [11]

It took about 10 minutes to completely answer the questionnaire. Those who owned electronic gadgets like smartphones, tablets, ipads, laptops, or any one of these were included in this study. Incompletely filled form were excluded from the study. The data thus obtained was compiled in Microsoft Excel 2016 and analyzed using SPSS software version 18. Standard descriptive statistics was used to express the data using numbers, mean \pm SD and, percentages as appropriate. Mean \pm SD hours of electronic gadget use before and during lockdown were calculated and Paired t-test was used for finding statistically significant difference. SAS-SV score and global PQSI score of all participants were calculated. Mean SAS-SV score and mean global PQSI score were compared using correlation coefficient. P-value < 0.05 was considered statistically significant.

The desired sample size was calculated to be 195(C.I.=95%). Data collection commenced on 28th August 2021 and was ended on 17th September after 208 responses were obtained.

3. Results

The findings of this study are discussed under the following headings:

3.1. Characteristics of the respondents

A total of 208 responses were obtained over a time period of three week. Of 208 responses, three responses were incomplete and two did not consent, therefore only 203 responses were included in the

study (figure 1).The study population comprised 53.2% (108) males and 46.8% (95) females. The mean age of the respondents was found to be 21.93 ± 1.514 (18-27) years.

3.2. Electronic gadgets use

Among the participants, 98% (199) possessed smartphones, 72.4% (147) possessed laptop/ desktop and 25.6% (52) possessed ipad/ tablets. Of four respondents who didn't have smartphones, three of them had it broken and sent for repair while one of them didn't have it from the beginning. Mean time spent in electronic gadgets before the lockdown was 4.52 ± 2.052 hours which raised significantly to 8.41 ± 3.293 hours during lockdown (p value=0.00) (Table 1). The participants used the gadgets for social media (94.6%), games (51.7%), entertainment like watching movies and series (89.2%), and educational purposes (85.7%).

Table 1
shows time spent on gadgets before and during lockdown. (N=203)

Mean time \pm SD (hours)	p-value
Before lockdown 4.52 ± 2.052	0.00
During lockdown 8.41 ± 3.293	

3.3. Smartphone addiction

In the study sample, the total SAS-SV score ranged from 13 to 60 with an average score of 32.46 ± 9.415 . Smartphone addiction was seen in 94 (46.30%) study subjects of which 56 (27.58%) were males and 38(18.71%) were females (figure 2). Smartphone addiction was found to be higher among males.

3.4. Sleep quality

The mean sleep duration during lock-down was 6.89 ± 1.193 hours. The global PSQI ranged between 1-16 with a mean score of 5.67 ± 2.88 . Of the total study subjects, 48.77% (99) had impaired sleep quality wherein 55 were males and 44 were females. According to PSQI, the cut-off for impaired sleep quality is 5. A linear positive correlation was found between electronic gadgets use and sleep quality (figure 3).

3.5. Smartphone usage and sleep quality

Significant relation between most of the components of PSQI with addicts and non-addicts was found. (Table 2)

Table 2: shows PSQI individual component and global score among smartphone addicts and non-addicts.

Components	Total score Mean±SD	Smartphone addicts	Smartphone Non-addicts	P- value
C1	0.92±0.72	1.07±0.660	0.79±0.746	0.005
C2	1.15±0.94	1.45±0.980	0.89±0.820	0.000
C3	0.71±0.66	0.76±0.698	0.67±0.624	0.358
C4	0.03±0.17	0.05±0.226	0.01±0.096	0.065
C5	1.92±0.58	2.05±0.575	1.80±0.557	0.002
C6	0.19±0.57	0.20±0.579	0.18±0.564	0.817
C7	1.76±0.78	1.00±0.816	0.55±0.673	0.000
Global PSQI score	5.67±2.89	6.59±2.807	4.89±2.733	0.000

4. Discussion

The nationwide lockdown was initiated to curtail the spread of coronavirus and 'flatten the curve' of the pandemic.[12] The Government of Nepal issued a notice to restrict the movement of people and instructed them to stay within their homes. All educational institutions throughout the country were temporarily shut down. Medical colleges took an innovative approach to continue education through online platforms like Zoom, Google classrooms, etc. [13] Change in daily routine, online education, and plenty of free time ultimately led to an increase in the use of electronic gadgets and thus increased screen time. There have not been enough studies to evaluate electronic gadget use and sleep quality among undergraduate medical students during the COVID-19 lockdown in Nepal. Our study evaluates the effect of lock-down on usage pattern of electronic gadgets and sleep quality among undergraduate medical students of Nepal.

The mean age of the participants in this study was 21.93±1.514 years with 53.2% males and 46.8% females, which is similar to the study of Vaidya, where it was 20.14±0.91 years. [5]

In this present study, 98% had smartphones which coincides with the findings of Hakura et al. where 98.6% of the participants owned smartphones. [14]

The mean time spent on electronic gadgets before the lockdown was 4.52±2.052 hours which raised significantly to 8.41±3.293 hours during the lockdown (p value=0.00). Similar findings were noticed in a study conducted among young adults of Spain where smartphone use significantly increased during COVID-19 lockdown compared to the pre-COVID phase. [15] In this present study, it was found students used electronic gadgets mostly for social media, watching movies and television series.

In accordance with the cut-off values for SAS-SV of more than 31 for males and more than 33 for females, this present study revealed less than half of the medical students (46.30%) were addicted to smartphones. This is similar to the findings reported by Dharmadhikari et al. [16]

However, a study conducted by Karki et al. reported lesser degree smartphone addiction (36.8%) among medical students. [17]

In our study smartphone addiction was found to be higher among males than females but was statistically insignificant. It means there is no gender predisposition for smartphone addiction. This is similar to the findings of Dharmadhikari et al. and Basu et al. [16][18] On the contrary, studies of Vaidya and Sharma et al. found significant smartphone addiction among males as compared to females. [5, 19] However, a study among university students of Saudi Arabia reported higher smartphone addiction among females. [6]

The mean sleep duration in this study was found to be 6.89 ± 1.193 . A study conducted by Sanudo et al. found total sleep hours significantly decreased during COVID-19 lockdown compared to pre-COVID phase. [15] However, a study by Celleni et al. found no significant change in sleep habits during COVID-19 lockdown. [20]

The global PSQI ranged between 1-16 with a mean score of 5.67 ± 2.88 . Nearly half of the respondents (48.77%) had impaired sleep quality. Males had more sleep impairment as compared to females. These findings are similar to the study by Vaidya where slightly less than half (46.04%) had impaired sleep. [5]

This cross-sectional study found a progressive linear correlation between SAS-SV score and PSQI ($r=0.337$). Similar finding was also reported in studies conducted by Demirci et al. and Kurugodiyavar MD et. [6, 21] Vaidya also reported a progressive linear correlation between SAS-SV score and PSQI but it was statistically insignificant. [5] This association between SAS-SV score and poor sleep quality is of importance because it affects the quality of life of future healthcare professionals.

Significant relations between various components of PSQI with addicts and non-addicts were noted in our study. However, Vaidya reported no significant association between the components of PSQI with addicts and non-addicts.

5. Conclusion

Compared to the pre-COVID phase, mean time spent on electronic gadgets increased considerably. Nearly half of the medical students are addicted to smartphones and have impaired sleep quality. This study is merely a partial snapshot of the present scenario; it does not take into account the situation of people other than medical students. The findings of this study may be of value in making preliminary recommendation on the need of self-care, being physically active and decreasing the screen time with a view to improve both physical and mental health.

A better understanding of the importance of sleep and reduction of screen time should be promoted for the well-being future healthcare professionals. Moreover, a general awareness of the harmful effects of prolonged screen time on sleep-wake cycle should be promoted.

Declarations

6.1 Ethics approval and consent to participate

Ethical approval for the study was obtained from Institutional Review Committee Lumbini Medical College.

Protocol number: IRC-LMC 04-D/021

Consent to participate was obtained from the participants via online questionnaire.

6.2 Consent for publication

Not applicable

6.3 Availability of data and materials

Not applicable

6.4 Competing interest

The authors declare that they have no competing interests

6.5 Funding

No source of funding was received for this study.

6.6 Authors' contribution

MU and AD collected and interpreted the data. AD analyzed the data. MU prepared the final manuscript. Both authors read and approved the final manuscript.

6.7 Acknowledgments

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Figures

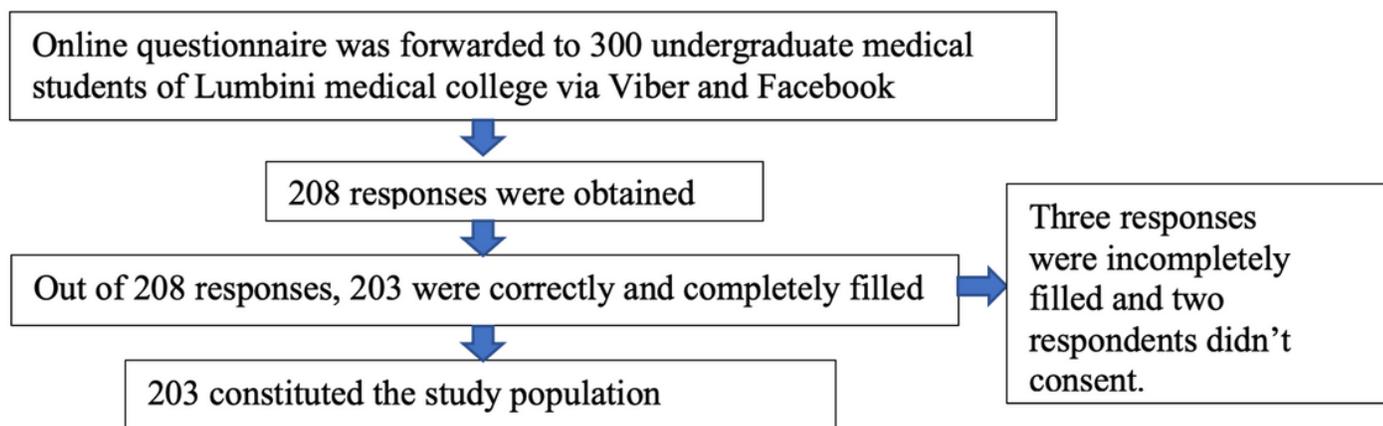


Figure 1

shows enrollment process of participants of this study.

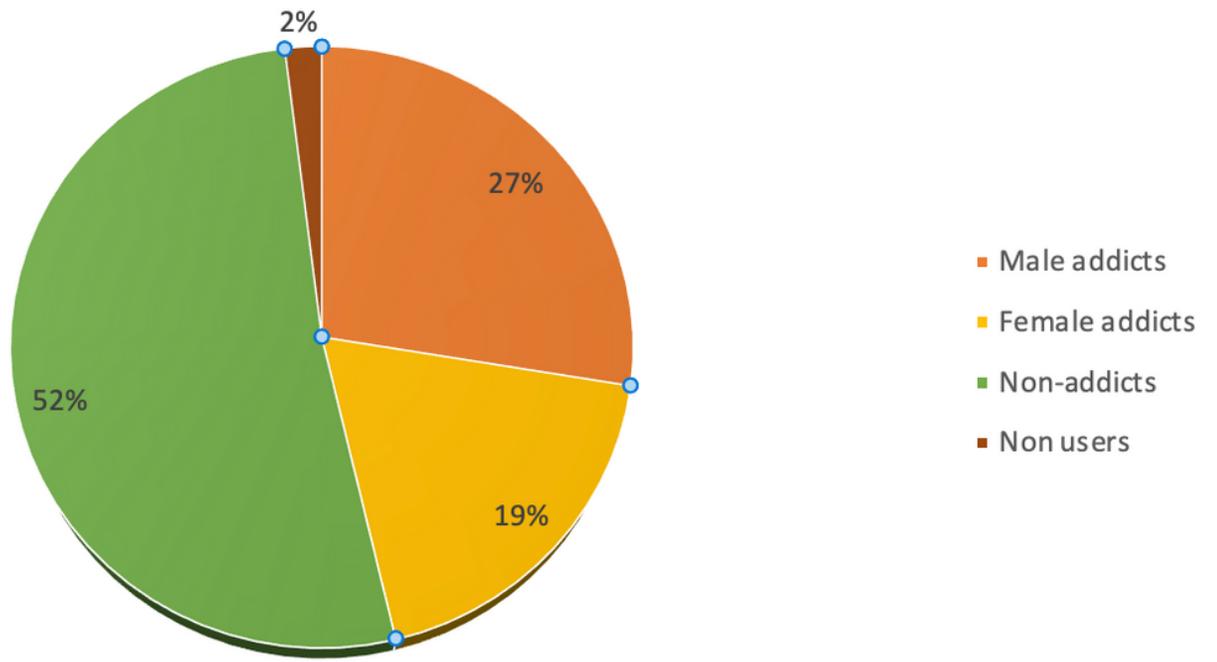


Figure 2

shows smartphone addiction among medical students. (n=203).

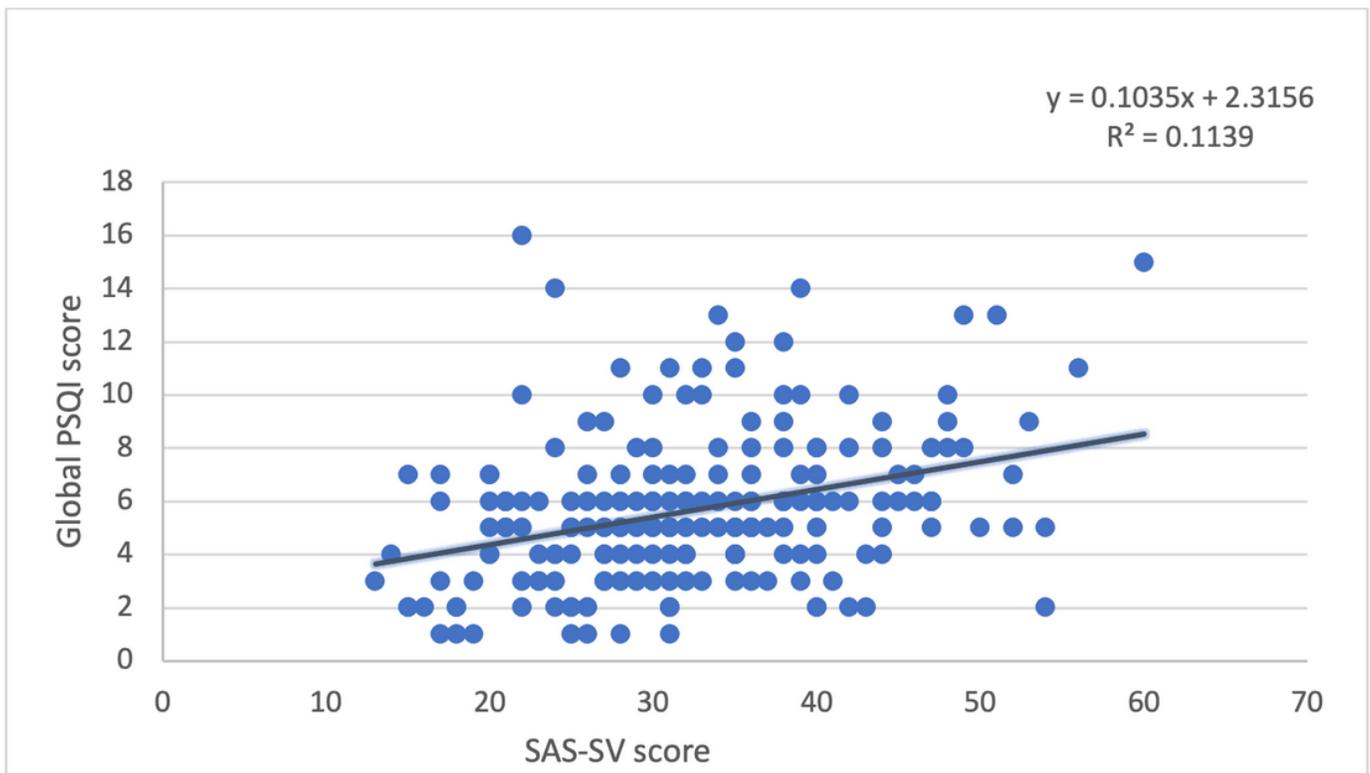


Figure 3

shows correlation between global PSQI score and SAS-SV score.